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## TROPICAL FOREST RESEARCH CENTER \*

### RIO PIEDRAS, PUERTO RICO

No. 4

#### CHEMICAL REMOVAL OF INFERIOR TROPICAL TREE SPECIES

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The permanent removal of undesirable or unmerchantable trees from natural forest stands, established plantations, or for land clearing at a reasonable cost is of primary interest to foresters, farmers, and landowners. Since January 1958 a program of chemical control of inferior trees has been carried on in the Luquillo Experimental Forest, Puerto Rico.

Situated in the high mountains on the eastern half of the island, the Luquillo Experimental Forest has some 175 tree species growing in its natural forest areas. Of these, only about 27 are considered of potentially high commercial value at the present time. In carrying out the timber stand improvement program on the forest, it is necessary to quickly remove the least desirable species and poorly formed or otherwise unmerchantable trees. Cutting or girdling has proven costly and results are slow and erratic due to sprouting from stumps or bridging of the girdles. Use of a herbicide solution has reduced the costs of such work materially and field checks of results show the treatment to be over ninety percent effective within six months.

A five-percent solution of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T)<sup>1/</sup>, using a low volatile ester, 4 lbs. acid equivalent, in diesel oil is applied to a hack-frill around the selected tree. The frill is made with a hand-axe or hatchet at a convenient height and the herbicide solution is applied from a one-gallon spout can. In some of the more resistant species, notably pomarrosa (Eugenia jambos) and mango (Mangifera indica), two frills about six inches apart give a wider band of dead cambium and quicker kill.

It has taken an average of eight to ten man-hours per acre for this type of treatment, depending on stand density, terrain, and weather conditions. One gallon of solution will treat about an acre and the cost of the solution is approximately forty cents per gallon.

<sup>1/</sup> A 5% solution is attained by thoroughly mixing one pint of the concentrate with four and one-half gallons of diesel oil. Kerosene or some other type of light fuel oil may be used equally as well.

\* Operated in cooperation with the University of Puerto Rico.



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Care must be taken to cut into the cambium at about a forty-five degree angle and completely around the tree. Also, the solution must be applied completely around the tree until it runs out of the frill.

Field checks of 1,000 trees in two separate areas of the forest treated six and twelve months previous showed 743 completely dead, 203 showed various stages of loss of vigor; and only 54 showed no crown effects of the treatment. Only five of the treated trees did not have a band of completely dead cambium at the frill. In all cases where the cambium is completely dead, the tree will eventually disappear from the stand. Of the 1,000 trees checked, only one had sprouted from the roots after treatment.

The following partial summary shows the results of treatment on sixteen of the most commonly occurring species in this study:

<u>Species</u>	<u>Total Treated</u>	<u>% Dead</u>
Hoja menuda ( <u>Myrcia</u> spp.)	251	96.4
Camasey ( <u>Miconia</u> spp.)	71	100.0
Rabo de ratón ( <u>Casearia</u> <u>arborea</u> )	65	96.9
Péndula ( <u>Citharexylum</u> <u>fruticosum</u> )	48	93.7
Guamá ( <u>Inga</u> <u>laurina</u> )	46	80.4
Achiotillo ( <u>Alchornea</u> <u>latifolia</u> )	36	97.2
Maricao ( <u>Byrsonima</u> <u>coriaceum</u> )	36	61.1
Guaraguao ( <u>Guarea</u> <u>trichilioides</u> )	30	80.0
Laurel geo ( <u>Ocotea</u> <u>portoricensis</u> )	25	92.0
Moral ( <u>Cordia</u> <u>sulcata</u> )	25	92.0
Jaguey ( <u>Ficus</u> <u>laevigata</u> )	17	94.1
Palo blanco ( <u>Casearia</u> <u>guianensis</u> )	17	82.3
Palo de matos ( <u>Ormosia</u> <u>krugii</u> )	14	100.0
Yagrumo hembra ( <u>Cecropia</u> <u>peltata</u> )	14	100.0
Manzanillo ( <u>Sapium</u> <u>laurocerasus</u> )	11	81.8
Laurel amarillo ( <u>Nectandra</u> <u>sintensisii</u> )	8	100.0
	714	92.4

August 31, 1960